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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,857	09/06/2003	V.S. Meenakshi Sundaram	SERIE 6052	8580
7590 09/01/2005			EXAMINER	
Air Liquide Suite 1800 2700 Post Oak Boulevard Houston, TX 77056			HUG, ERIC J	
			ART UNIT	PAPER NUMBER
			1731	

DATE MAILED: 09/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/656,857	Applicant(s) SUNDARAM ET AL.	
	Examiner Eric Hug	Art Unit 1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 31 is/are allowed.
- 6) ☒ Claim(s) 1-11, 14-17 and 25 is/are rejected.
- 7) ☒ Claim(s) 12, 13, 18-24 and 26-30 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114.

Applicant's submission filed on June 10, 2005 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 25 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 25 recites the limitation "non-adjacently upstream of the headbox". It is uncertain what is meant by "non-adjacently upstream" as the term is not defined anywhere in the disclosure.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-11, 14-17, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leino et al (WO 99/24661).

Leino discloses a process for improving the drainage or dewatering of a cellulosic pulp suspension in a paper making machine by treating it with carbon dioxide just prior to dewatering on the wire section of the paper machine. Carbon dioxide is added in an amount sufficient to significantly improve the drainage of the pulp. The pulp suspension to be treated with the carbon dioxide may be any papermaking stock, white water, or dilution water which has entered the short circulation of a paper making machine or directly into the flow of dilute pulp entering the headbox of the paper machine. These carbon dioxide addition points are equivalent to those disclosed by Applicant on page 18 of the instant specification. The carbon dioxide is added at a rate of 0.5-5 kg/ton of paper or pulp.

Leino does not disclose the complete make-up of the pulp suspension, however it would have been obvious to one skilled in the art that the pulp suspension at the headbox contains other materials such as those disclosed by Applicant as being typical. For example, it would have been obvious to add mineral fillers such as calcium carbonate to the pulp furnish to impart bulk, brightness, opacity, or other properties to the formed sheet of paper. It would have also been obvious, at least in the absence of carbon dioxide, to include surface active inorganic and/or polymeric retention aids, to the pulp furnish for maximizing retention of fines and fillers on the paper machine wire during drainage.

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Leino does not disclose the mechanism by which carbon dioxide improves drainage, thus does not disclose that the carbon dioxide changes the value of an electrical property of any one or more of the pulp constituents. However, it is well known in the art of papermaking that drainage of a pulp suspension is strongly dependent on the electrical properties of a pulp furnish, such as the surface charge on the cellulose fibers, and that these properties are strongly influenced by the presence of the other additives in the suspension. Applicant has discussed in great detail known effects of additives on the charge of pulp fibers, and how the charge on the fibers affects retention and drainage. Thus, based on the teachings of Leino and on those of the prior art regarding the charge on pulp fibers, it is the examiner's position that the present invention does not differ from that of Leino, and that Applicant has merely explained the mechanism by which carbon dioxide improves drainage. The process of adding carbon dioxide in Leino is the same as the process of the present invention. Thus, it flows naturally that the addition of carbon dioxide to pulp in Leino substantially changes the surface charge of the pulp fibers in a way that alters the drainage.

It is noted that in Example 3, Leino shows that the improvement of draining by addition of carbon dioxide is not merely a pH effect.

Regarding claim 2, the partial dissolution of calcium carbonate would naturally occur after addition of carbon dioxide to a papermaking furnish comprising calcium carbonate.

Regarding claims 3-7, the papermaking compositions (pulp slurry, broke, whitewater, and diluted pulp slurry), if not fully disclosed by Leino, are conventional to papermaking operations. Any one or more of the so-called papermaking compositions would be suitable for carbon dioxide treatment as taught by Leino.

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Regarding claims 8-11 and 14-17, the physical properties of zeta potential, conductivity, charge demand, and streaming potential would naturally all be affected by carbon dioxide addition as claimed.

Regarding claim 25, the addition point of carbon dioxide in Leino is identically downstream of a pulp chest and upstream of the headbox.

Allowable Subject Matter

Claims 12, 13, 18-24, and 26-30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 31 is allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 12, 13, 20, 21, 23, 24, and 26-30 are allowable for providing at least a step of measuring and/or controlling at least one of the electrical properties.

Claims 18-19, and 22 are allowable for further introducing the carbon dioxide to a composition comprising pulp fibers present at a consistency greater than 3%.

Claim 31 is allowed for further providing the step of reducing the amount of chemical additives in a papermaking composition while introducing carbon dioxide to that composition.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Braun (US 3,557,956) discloses adding carbon dioxide in a pulp de-inking process.

Gane et al (US 6,666,953) discloses a mineral pigment or filler containing a natural calcium carbonate, treated with one of more providers of H_3O^+ ions and gaseous CO_2 , such pigment or filler interacting differently with fibers and increasing the bulk of paper.

Brotto et al (US 6,200,416) discloses adding carbon dioxide to thick stock pulp containing aluminum species to dissolve the aluminum species.

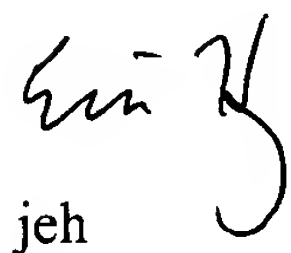
Karlsson et al (US 2002/0134519) discloses adding carbon dioxide to paper machine waters to remove detrimental substances.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Hug whose telephone number is 571 272-1192. The examiner can normally be reached on Monday through Friday, 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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